

AMENDMENTS TO THE CLAIMS

1. (Currently Amended) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer, the first electrode contact layer comprising a Si/In-codoped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer;

wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

2. (Original) The device according to claim 1, wherein the second electrode contact layer is an n-type electrode contact layer.

3. (Original) The device according to claim 1, wherein the buffer layer comprises one selected from the group consisting of an InGaN/GaN super lattice structure, an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure and an $\text{Al}_x\text{In}_y\text{Ga}_{1-x,y}\text{N}/\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure.

Claim 4 (Cancelled)

5. (Original) The device according to claim 1, wherein the active layer comprises a single or multiple quantum well structure.

Claim 6 (Cancelled)

7. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

- a substrate;
- a buffer layer formed above the substrate;
- a first In-doped GaN layer formed above the buffer layer;
- an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;
- a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer,

wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

8. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a second In-doped GaN layer;

a GaN layer formed above the second In-doped GaN layer; and

a second electrode contact layer formed above the GaN layer,

wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, the $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer have an In content expressed as $0 < x < 0.05$, $0 < y < 0.3$ and $0 < z < 0.1$, respectively.

9. (Currently Amended) The device according to claim 61, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration.

10. (Currently Amended) The device according to claim 61, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration, and wherein the spiral surface configuration is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

11. (Original) The device according to claim 1, wherein the second electrode contact layer comprises an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure.

12. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

- a substrate;
- a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;
an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;
a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;
an active layer formed above the first electrode contact layer and functioning to emit light;
a second In-doped GaN layer;
a GaN layer formed above the second In-doped GaN layer; and
a second electrode contact layer formed above the GaN layer,
wherein the first In-doped GaN layer and the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed thereon are repeatedly layered in plurality.

13. (Currently Amended) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;
a buffer layer formed above the substrate;
a first In-doped GaN layer formed above the buffer layer;
an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the ~~first In-doped GaN layer~~ $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer, the first electrode contact layer comprising a Si/In-codoped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

14. (Original) The device according to claim 13, wherein the second electrode contact layer is an n-type electrode contact layer.

15. (Previously Presented) The device according to claim 13, further comprising a second In-doped GaN layer formed between the active layer and the GaN layer, and the GaN layer is p-type.

16. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

17. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first In-doped GaN layer formed above the buffer layer;

an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure and an undoped GaN layer formed above the first In-doped GaN layer;

a first electrode contact layer formed above the $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure and an undoped GaN layer;

an active layer formed above the first electrode contact layer and functioning to emit light;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer.

18. (Previously Presented) The device according to claim 13, wherein the buffer layer comprises one selected from the group consisting of an InGaN/GaN super lattice structure, an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure and an $\text{Al}_x\text{In}_y\text{Ga}_{1-x-y}\text{N}/\text{In}_x\text{Ga}_{1-x}\text{N}/\text{GaN}$ structure.

Claim 19 (Cancelled)

20. (Original) The device according to claim 13, wherein the active layer comprises a single or multiple quantum well structure.

21. (Original) The device according to claim 13, wherein the active layer comprises a single or multiple quantum well structure, including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

22. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

- a substrate;
- a buffer layer formed above the substrate;
- a first In-doped GaN layer formed above the buffer layer;
- a first electrode contact layer formed above the first In-doped GaN layer;
- an active layer formed above the first electrode contact layer and functioning to emit light;
- a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer,
wherein the active layer comprises a single or multiple quantum well structure,
including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

23. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;
a buffer layer formed above the substrate;
a first In-doped GaN layer formed above the buffer layer;
a first electrode contact layer formed above the first In-doped GaN layer;
an active layer formed above the first electrode contact layer and functioning to emit light;
a GaN layer formed above the active layer; and
a second electrode contact layer formed above the GaN layer,
wherein the active layer comprises a single or multiple quantum well structure,
including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer, and the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, the $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer have an In content expressed as $0 < x < 0.05$, $0 < y < 0.3$ and $0 < z < 0.1$, respectively.

24. (Currently Amended) The device according to claim ~~21~~23, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration.

25. (Currently Amended) The device according to claim ~~21~~23, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration, and wherein the spiral surface configuration is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

26. (Currently Amended) The device according to claim ~~13~~23, wherein the second electrode contact layer comprises an $\text{In}_x\text{Ga}_{1-x}\text{N}/\text{In}_y\text{Ga}_{1-y}\text{N}$ super lattice structure.

Claims 27-35 (Cancelled)

36. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

- a substrate;
- a buffer layer formed above the substrate;
- a first electrode contact layer formed above the buffer layer;
- an active layer formed above the first electrode contact layer, and including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer;
- a GaN layer formed above the active layer; and
- a second electrode contact layer formed above the GaN layer,

wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has an In content smaller than that of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.

37. (Previously Presented) A nitride based 3-5 group compound semiconductor light emitting device comprising:

a substrate;

a buffer layer formed above the substrate;

a first electrode contact layer formed above the buffer layer;

an active layer formed above the first electrode contact layer, and including a low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and an $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer;

a GaN layer formed above the active layer; and

a second electrode contact layer formed above the GaN layer,

wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, the $\text{In}_y\text{Ga}_{1-y}\text{N}$ well layer and the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer have an In content expressed as $0 < x < 0.05$, $0 < y < 0.3$ and $0 < z < 0.1$, respectively.

38. (Currently Amended) The device according to claim ~~34~~37, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration.

39. (Currently Amended) The device according to claim ~~34~~37, wherein the low mole In-doped $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer has a spiral surface configuration, wherein the spiral surface configuration is extended to the surface of the $\text{In}_z\text{Ga}_{1-z}\text{N}$ barrier layer.